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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/687,784

10/17/2003

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RMI1P040/RZMI-P0310-US

9860

76265 7590 09/01/2009
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EXAMINER

ANDREWS, LEON T

ART UNIT

PAPER NUMBER

2416

MAIL DATE

DELIVERY MODE

09/01/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/687,784	Applicant(s) SINGH ET AL.	
	Examiner LEON ANDREWS	Art Unit 2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,6-9,11,14-18,21 and 23-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6-9,11,14-18,21 and 23-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

RCE

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 17, 2009 has been entered.

Claim Objections

2. **Claim 6** is objected to because of the following informality:

Claim 6, line 1 recites “packet duplication of claim 5”. But, claim 5 has been cancelled.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

3. Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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Claims 11, 14-18 and 26 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 11, 14-18 and 26 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be performed, a statutory “process” under 35 U.S.C. 101 must (1) be tied to particular machine, or (2) transform underlying subject matter (such as an article or material) to a different state or thing. See page 10 in *Re to Bilski* 88 USPQ 2d 1385. The instant claims are neither positively tied to a particular machine that accomplishes the claimed method steps nor transform underlying subject matter, and therefore do not qualify as a statutory process. The method including steps of receiving, performing, accessing, applying, retrieving and obtaining is broad enough that the claims cannot be completely performed manually without a machine nor is any transformation apparent.

4. **Claims 1-2, 4, 6-9, 11, 14-18, 21 and 23-28** are being rejected under 35 U.S.C. 103(a) by Wong (Pub. No.: 2004/0264464 A1 using Provisional application No.: 60/482,759) in view of Tang et al. (Patent No.: US 6,553,028 B1).

Regarding Claim 1, Wong discloses a multicast packet duplication system for multicast packets (Internet Protocol Multicast (IPMC) packet duplication covers tables required to implement the MMU and egress module, page 3, lines 2-4) containing at least multicast address data (multicast packet is replaced with source MAC address, page 3, lines 14-15), comprising:

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an input port (Block Diagram, CPI ingress bus, page STN-2) configured to receive a packet (IPMC packet, page 5, line 21);

a pointer table (ECMP Support, LPM table, page STN-7) having a width comprising a plurality of entries (ECMP Support, LPM table, page STN-7; ECMP Dest_Ip, steps 2 and 3, LPM table with ip addresses, page STN-8) coupled to a linked-list table (ECMP Support, L3 table, page STN-7; steps 6 and 7, L3_table_index, index points to entry of 8 entries in the L3 table); and a plurality of output ports (Fig. 2, multicast packet generated and routed to RCVs 204-210 by way of router 250, column 8, lines 64-65; ports of the egress VLAN that receive the frame, column 14, lines 30-31) configured to output the packet, wherein:

a number of duplications of the packet for each of the plurality of output ports is controlled by descriptors (replication engine includes the pointer and index where the index (descriptor) enables the replication engine to perform multicast packet replication, further specifies the port with the incoming (ingress) VLAN and rewrites the frame (hashing) destined to ports on the VLAN (output ports) other than the ingress VLAN, column 14, lines 4-15) arranged in a linked-list table (ECMP Support, L3 table, page STN-7) indexed by a hashing function (each multicast entry accessed by IP source address, IP destination address and the VLAN ID are hashed using a hash algorithm, column 12, lines 59-62) applied to said multicast address data (packet is replicated and forwarded and is the index into the IP multicast VLAN ID table, the IP recalculation and SA of the packet replaced with the IP multicast address, the packet is routed on to the outgoing VLAN, Replication Flow, page STN-48, lines 1-17); wherein an encoding format (replication for the frame, column 14, lines 42-43) of the descriptors include at least one of:

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a contiguous range encoding that includes a starting indicator and an ending indicator (replication process for each outgoing VLAN starts from the pointer 750 (starting indicator) until an entry having an asserted control bit (ending indicator) specifies the termination of the replication for the frame, column 14, lines 37-43); or

a non-contiguous range encoding that includes a most significant bit (MSB) portion of an indicator and a bitmap decoded from a least significant bit (LSB) portion of the indicator;

and

a discrete encoding that includes a first indicator and a second indicator,

wherein: the encoding format is configured to be selected in response to control bits (an entry having an asserted control bit specifies the termination of the replication for the frame, then the replication process for each VLAN starts from the pointer 750, column 14, lines 37-43);

wherein each of the plurality of entries includes a pointer descriptor which includes a plurality of linked-list pointers corresponding to the plurality of output ports (IPMC_PTR is used to index into the IP multicast VLAN ID table which stores VLAN IDs where the bit position in this table is the index with the VLAN ID routed to outgoing VLAN, Replication Flow, page STN-48, lines 1-17).

Wong fails to disclose plurality of output ports, hashing function and continuous range that includes starting/ending indicators.

But, Tang et al. discloses Fig. 2, multicast packet generated and routed to RCVs 204-210 by way of router 250, column 8, lines 64-65; each multicast entry accessed by IP source address, IP destination address and the VLAN ID are hashed using a hash algorithm, column 12, lines 59-

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62), and replication process for each outgoing VLAN starts from the pointer 750 (starting indicator) until an entry having an asserted control bit (ending indicator) specifies the termination of the replication for the frame, column 14, lines 37-43.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Tang et al.'s plurality of output ports, hashing function and continuous range that includes a starting/ending indicators because this would have allowed the switch to forward the routed multicast packet/frames to the RCVs 206-210 coupled to its ports, column 9, lines 9-11.

Again, Wong fails to disclose plurality of entries include descriptor with pointer to port.

But, Tang et al. discloses plurality of entries each of which is accessed by VLAN ID (pointer) and further includes index field containing port index value, column 9, lines 60-64.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Tang et al.'s plurality of entries include descriptor with pointer to port because this would have allowed the port index to become the which responds with the port select signals indicating which ports to receive the fame, columns 9 and 10, lines 64-67 and 1-2 respectively.

Regarding Claims 2 and 14, Wong discloses the packet duplication system and method (IPMC Replication steps, page STN-13), wherein: each of the number of duplications is coupled to a Virtual Local Area Network (VLAN) (IPM packet replication per VLAN, page STN-10, line 8).

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Regarding Claims 4 and 15, Wong discloses the packet duplication system and method, wherein: the VLAN pointer descriptors arranged in the linked-list table include at least one shared descriptor (IPMC_PTR is the index in the IP multicast group vector table is also the index in the IP multicast VLAN ID table, Replication Flow, page STN-48, lines 1-3).

Regarding Claim 6, Wong discloses the packet duplication system of claim 5, wherein: each of the plurality of entries (column of 8 entries in the L3 table, ECMP Dest_Ip Search, step 7, page STN-8) corresponds to one of the plurality of output ports (Block Diagram, CPE egress bus, page STN-2).

Regarding Claims 7 and 16, Wong discloses the packet duplication system and method, wherein: the contiguous range encoding includes a starting Virtual Local Area Network (VLAN) indicator (IPMC Replication, VLAN_ID1, step 9, page STN-13) and an ending VLAN indicator (IPMC Replication, VLAN_ID2, step 12, page STN-13).

Regarding Claims 8 and 17, Wong discloses the packet duplication system and method, wherein: the non-contiguous range encoding includes a most significant bit (MSB) portion (IPMC Replication, 64-bit vector for specifying the MS (Most Significant) 6 bits of VLAN_ID, page STN-11, lines 11-12) of a Virtual Local Area Network (VLAN) indicator (IPMC Replication, VLAN_ID, page STN-11) and a bitmap (ECMP Dest_Ip Search, step 7, LPM table get 12-bit L3_table_index with 3-bit count field, page STN-8) decoded from a least significant bit (LSB) portion (ECMP Dest_Ip Search, step 8, index points to the first entry of column of 8-

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entries in the L3 table, page STN-8) of the VLAN indicator.

Regarding Claims 9 and 18, Wong discloses the packet duplication system and method, wherein: the discrete encoding includes a first Virtual Local Area Network (VLAN) indicator (IPMC Replication, VLAN_ID1, step 9, page STN-13) and a second VLAN indicator (IPMC Replication, VLAN_ID2, step 12, page STN-13).

Regarding Claim 11, Wong discloses a method (IPMC Replication steps, page STN-13) of controlling a duplication of a multicast packet (Internet Protocol Multicast (IPMC) packet duplication covers tables required to implement the MMU and egress module, page 3, lines 2-4) containing at least multicast address data (multicast packet is replaced with source MAC address, page 3, lines 14-15), comprising:

receiving the packet (Block Diagram, CPI ingress bus, page STN-2);

performing a hashing function (each multicast entry accessed by IP source address, IP destination address and the VLAN ID are hashed using a hash algorithm, column 12, lines 59-62) on said multicast address data;

using the results of said hashing function as an index for a linked-list table (VLAN ID of the packet with IP recalculation and the SA of the packet replaced with IP multicast address where the VLAN ID in the VLAN ID table corresponds to bit position and the bit position is the index into the IP multicast VLAN table, Replication Flow, page STN-48, lines 2-17);

said linked-list table including a plurality of pointers (Head_Pointer and the Next_Pointer used as index to the LS table, step 5, STN-13);

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accessing a first multicast descriptor pointer (ECMP Dest_Ip Search, LPM table 1st-searchkey=lpm_addr [14:0] = {11 'h0, ip0, step 3, page STN-8} in said linked-list table; said multicast descriptor pointer pointing to multicast descriptors comprised of at least multicast Virtual Area Network (VLAN) pointers (ECMP Dest_Ip Search, step 10, VLAN_tag, page STN-8);

using at least one of said multicast VLAN pointers to access a multicast VLAN table (ECMP Dest_Ip Search, step 10, L3 Interface Table, page STN-8) comprised of a second pointers to VLAN pointer descriptors (ECMP Dest_Ip Search, Next-searchkey = lpm_addr [14:0] = {next_pointer,lpn), step 5, page STN-8);

accessing a VLAN pointer descriptor (ECMP Dest_Ip Search, step 10, VLAN_tag, page STN-8) in response to the second pointer; and using information contained in said VLAN pointer descriptor to control applying an encoding for the duplication of the packet (replication engine includes the pointer and index where the index (descriptor) enables the replication engine to perform multicast packet replication, column 14, lines 4-10);

wherein applying the encoding includes selecting a format of descriptors, the format including at least one of:

- a contiguous range encoding that includes a starting indicator and an ending indicator (replication process for each outgoing VLAN starts from the pointer 750 (starting indicator) until an entry having an asserted control bit (ending indicator) specifies the termination of the replication for the frame, column 14, lines 37-43); or
- a non-contiguous range encoding that includes a most significant bit (MSB) portion of an indicator and a bitmap decoded from a least significant bit (LSB) portion of the indicator;

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and

a discrete encoding that includes a first indicator and a second indicator,

wherein: the encoding format is configured to be selected in response to control bits (an entry having an asserted control bit specifies the termination of the replication for the frame, then the replication process for each VLAN starts from the pointer 750, column 14, lines 37-43);

wherein a pointer table (ECMP Support, LPM table, page STN-7) has a width comprising a plurality of entries (ECMP Support, LPM table, page STN-7; ECMP Dest_Ip, steps 2 and 3, LPM table with ip addresses, page STN-8) coupled to a linked-list table (ECMP Support, L3 table, page STN-7; steps 6 and 7, L3_table_index, index points to entry of 8 entries in the L3 table), each of the plurality of entries including a pointer descriptor which includes a plurality of linked-list pointers corresponding to the plurality of output ports (IPMC_PTR is used to index into the IP multicast VLAN ID table which stores VLAN Ids where the bit position in this table is the index with the VLAN ID routed to outgoing VLAN, Replication Flow, page STN-48, lines 1-17).

Wong fails to disclose plurality of output ports, hashing function and continuous range that includes starting/ending indicators.

But, Tang et al. discloses Fig. 2, multicast packet generated and routed to RCVs 204-210 by way of router 250, column 8, lines 64-65; each multicast entry accessed by IP source address, IP destination address and the VLAN ID are hashed using a hash algorithm, column 12, lines 59-62), and replication process for each outgoing VLAN starts from the pointer 750 (starting

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indicator) until an entry having an asserted control bit (ending indicator) specifies the termination of the replication for the frame, column 14, lines 37-43.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Tang et al.'s plurality of output ports, hashing function and continuous range that includes a starting/ending indicators because this would have allowed the switch to forward the routed multicast packet/frames to the RCVs 206-210 coupled to its ports, column 9, lines 9-11.

Regarding claims 21 and 25 Wong discloses a multicast packet duplication system for multicast packets (Internet Protocol Multicast (IPMC) packet duplication covers tables required to implement the MMU and egress module, page 3, lines 2-4) containing at least multicast address data (multicast packet is replaced with source MAC address, page 3, lines 14-15), comprising: an input port (Block Diagram, CPI ingress bus, page STN-2) configured to receive a packet (IPMC packet, page 5, line 21); a pointer table (ECMP Support, LPM table, page STN-7) having a width comprising a plurality of entries (ECMP Support, LPM table, page STN-7; ECMP Dest_Ip, steps 2 and 3, LPM table with ip addresses, page STN-8) coupled to a linked-list table (ECMP Support, L3 table, page STN-7; steps 6 and 7, L3_table_index, index points to entry of 8 entries in the L3 table); and a plurality of output ports (Block Diagram, CPE egress bus, page STN-2) configured to output the packet; said output ports being coupled to one or more Virtual Local Area Networks (VLAN) (VLAN) (IPM packet replication per VLAN, page STN-10, line 8);

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wherein said system applies a hashing function (each multicast entry accessed by IP source address, IP destination address and the VLAN ID are hashed using a hash algorithm, column 12, lines 59-62) to the multicast address data of said multicast packets; and

wherein said system uses the result of said hashing function as an index to a linked- list table (VLAN ID of the packet with IP recalculation and the SA of the packet replaced with IP multicast address where the VLAN ID in the VLAN ID table corresponds to bit position and the bit position is the index into the IP multicast VLAN table, Replication Flow, page STN-48, lines 2-17); said linked-list table having entries that comprise either multicast descriptors (index into the IP multicast VLAN ID table which stores VLAN Ids corresponding to the bit position and the bit position in this table is the index with the VLAN ID table, Replication Flow, page STN-48, lines 1-5) or pointers (Head_Pointer and the Next_Pointer used as index to the LS table, step 5, STN-13) to multicast descriptors;

said multicast descriptors being comprised of at least multicast VLAN descriptors or pointers (ECMP Dest_Ip Search, step 10, VLAN_tag, page STN-8) to multicast VLAN descriptors;

wherein a number of distributions of said multicast packet and an output port distribution of said multicast packet is controlled by information stored in either the multicast descriptors or multicast VLAN descriptors (replication engine includes the pointer and index where the index (descriptor) enables the replication engine to perform multicast packet replication, further specifies the port with the incoming (ingress) VLAN and rewrites the frame destined to ports on the VLAN (output ports) other than the ingress VLAN, column 14, lines 4-15);

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wherein said multicast VLAN descriptors contain a plurality of entries (column of 8 entries in the L3 table, ECMP Dest_Ip Search, step 7, page STN-8) each describing the multicast packet distribution to a different VLAN (VLANs, page 3, lines 6-7); and

wherein an encoding format (replication for the frame, column 14, lines 42-43) said VLAN descriptors include at least one of:

a contiguous range encoding that includes a starting VLAN indicator and an ending VLAN indicator (replication process for each outgoing VLAN starts from the pointer 750 (starting indicator) until an entry having an asserted control bit (ending indicator) specifies the termination of the replication for the frame, column 14, lines 37-43); or

a non-contiguous range encoding that includes a most significant bit (MSB) portion of a VLAN indicator and a bitmap decoded from a least significant bit (LSB) portion of the VLAN indicator; and

a discrete encoding that includes a first VLAN indicator and a second VLAN indicator, wherein: the encoding format is configured to be selected in response to control bits (an entry having an asserted control bit specifies the termination of the replication for the frame, then the replication process for each VLAN starts from the pointer 750, column 14, lines 37-43);

wherein each of the plurality of entries of the pointer table includes a pointer descriptor which includes a plurality of linked-list pointers corresponding to the plurality of output ports (IPMC_PTR is used to index into the IP multicast VLAN ID table which stores VLAN IDs where the bit position in this table is the index with the VLAN ID routed to outgoing VLAN, Replication Flow, page STN-48, lines 1-17)

Wong fails to disclose plurality of output ports, hashing function and continuous range that includes starting/ending indicators.

But, Tang et al. discloses Fig. 2, multicast packet generated and routed to RCVs 204-210 by way of router 250, column 8, lines 64-65; each multicast entry accessed by IP source address, IP destination address and the VLAN ID are hashed using a hash algorithm, column 12, lines 59-62), and replication process for each outgoing VLAN starts from the pointer 750 (starting indicator) until an entry having an asserted control bit (ending indicator) specifies the termination of the replication for the frame, column 14, lines 37-43.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Tang et al.'s plurality of output ports, hashing function and continuous range that includes a starting/ending indicators because this would have allowed the switch to forward the routed multicast packet/frames to the RCVs 206-210 coupled to its ports, column 9, lines 9-11.

Again, Wong fails to disclose plurality of entries include descriptor with pointer to port.

But, Tang et al. discloses plurality of entries each of which is accessed by VLAN ID (pointer) and further includes index field containing port index value, column 9, lines 60-64.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Tang et al.'s plurality of entries include descriptor with pointer to port because this would have allowed the port index to become the which responds with the port select signals indicating which ports to receive the fame, columns 9 and 10, lines 64-67 and 1-2 respectively.

Regarding Claim 23, Wong discloses the packet duplication system of claim 21, wherein said multicast descriptors also include a multicast packet time to live field (packet aging based on packet time stamp, page STN-49, line 16).

Regarding Claim 24, Wong discloses the packet duplication system of claim 21, wherein said multicast Virtual Local Area Network (VLAN) descriptors contain a plurality of entries (column of 8 entries in the L3 table, ECMP Dest_Ip Search, step 7, page STN-8) each describing the multicast packet distribution to a different VLAN (VLANs, page 3, lines 6-7).

Regarding Claim 26, Wong discloses a method (IPMC Replication steps, page STN-13) of controlling a duplication of one or more multicast packets (Internet Protocol Multicast (IPMC) packet duplication covers tables required to implement the MMU and egress module, page 3, lines 2-4) containing at least multicast address data (multicast packet is replaced with source MAC address, page 3, lines 14-15), comprising:
receiving (Block Diagram, CPI ingress bus, page STN-2) the multicast packet;

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applying a hashing function (each multicast entry accessed by IP source address, IP destination address and the VLAN ID are hashed using a hash algorithm, column 12, lines 59-62) to the multicast address data of said multicast packets;

using the result of the hashing function as an index (VLAN ID of the packet with IP recalculation and the SA of the packet replaced with IP multicast address where the VLAN ID in the VLAN ID table corresponds to bit position and the bit position is the index into the IP multicast VLAN table, Replication Flow, page STN-48, lines 2-17);

retrieving a multicast descriptor from said linked-list table (LPM table get 12 bit L3_table_index, Dest_Ip Search, step 6, page STN-8);

using said multicast descriptor to find the multicast packet time to live data (packet aging based on packet time stamp, page STN-49, line 16) and a Virtual Local Area Network (VLAN) descriptor (ECMP Dest_Ip Search, step 10, VLAN_tag, page STN-8)

obtaining information regarding how said multicast packets should be distributed to various output ports to at least one VLAN from said VLAN descriptor; and

using this distribution information to distribute said multicast packets to said at least one VLAN (replication engine includes the pointer and index where the index (descriptor) enables the replication engine to perform multicast packet replication, further specifies the port with the incoming (ingress) VLAN and rewrites the frame destined to ports on the VLAN (output ports) other than the ingress VLAN, column 14, lines 4-15);

wherein an encoding format (replication for the frame, column 14, lines 42-43) of said VLAN descriptors include at least one of:

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a contiguous range encoding that includes a starting VLAN indicator and an ending VLAN indicator (replication process for each outgoing VLAN starts from the pointer 750 (starting indicator) until an entry having an asserted control bit (ending indicator) specifies the termination of the replication for the frame, column 14, lines 37-43); or

a non-contiguous range encoding that includes a most significant bit (MSB) portion of a VLAN indicator and a bitmap decoded from a least significant bit (LSB) portion of the VLAN indicator; and

a discrete encoding that includes a first VLAN indicator and a second VLAN indicator, wherein: the encoding format is configured to be selected in response to control bits (an entry having an asserted control bit specifies the termination of the replication for the frame, then the replication process for each VLAN starts from the pointer 750, column 14, lines 37-43); wherein a pointer table (ECMP Support, LPM table, page STN-7) having a width comprising a plurality of entries (ECMP Support, LPM table, page STN-7; ECMP Dest_Ip, steps 2 and 3, LPM table with ip addresses, page STN-8) coupled to a linked-list table (ECMP Support, L3 table, page STN-7; steps 6 and 7, L3_table_index, index points to entry of 8 entries in the L3 table), each of the plurality of entries including a pointer descriptor which includes a plurality of linked-list pointers corresponding to the plurality of output ports (IPMC_PTR is used to index into the IP multicast VLAN ID table which stores VLAN IDs where the bit position in this table is the index with the VLAN ID routed to outgoing VLAN, Replication Flow, page STN-48, lines 1-17).

Wong fails to disclose plurality of output ports, hashing function and continuous range that includes starting/ending indicators.

But, Tang et al. discloses Fig. 2, multicast packet generated and routed to RCVs 204-210 by way of router 250, column 8, lines 64-65; each multicast entry accessed by IP source address, IP destination address and the VLAN ID are hashed using a hash algorithm, column 12, lines 59-62), and replication process for each outgoing VLAN starts from the pointer 750 (starting indicator) until an entry having an asserted control bit (ending indicator) specifies the termination of the replication for the frame, column 14, lines 37-43.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Tang et al.'s plurality of output ports, hashing function and continuous range that includes a starting/ending indicators because this would have allowed the switch to forward the routed multicast packet/frames to the RCVs 206-210 coupled to its ports, column 9, lines 9-11.

Regarding Claim 27, Wong discloses the packet duplication system of claim 1, wherein a first descriptor in the linked-list table includes a first link to a second descriptor in the linked-list table.

Wong fails to disclose first descriptor to second descriptor in the table.

But, Tang et al. discloses Fig. 3, the port index becomes the destination index in the table, column 9, lines 64-65.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Tang et al.'s first descriptor to second descriptor in the table because this would have allowed the port index to become the destination index when there was a hit in the table which responds to the select signals over the switching bus, columns 9 and 10, lines 64-67 and line 1 respectively.

Regarding Claim 28, Wong discloses the packet duplication system of claim 27, wherein the second descriptor in the linked-list table includes a second link to a third descriptor in the linked-list table.

Wong fails to disclose second descriptor to third descriptor in the table.

But, Tang et al. discloses Fig. 3, the destination index is then used to reference an index entry 352 in the table, column 9, lines 65-66.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Tang et al.'s second descriptor to third descriptor in the table because this would have allowed the destination index to reference the index entry when there was a hit in the table which responds to the select signals over the switching bus, columns 9 and 10, lines 64-67 and line 1 respectively.

Response to Arguments

5. Applicant's arguments filed August 17, 2009 have been considered. But, in view of the new grounds of rejection resulting from the amended claims, the arguments are moot.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Andrews whose telephone number is (571) 270-1801. The examiner can normally be reached on Monday through Friday 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rao S. Seema can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Kevin C. Harper/

Primary Examiner, Art Unit 2416

LA/la
August 27, 2009